RFID Interface Module
Model
ECL2-V680D1

User's Manual
(Hardware)

CC-Link V2

Model	ECL2-V680D1
	50CM-D180159-B(1410)MEE

MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED
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● SAFETY PRECAUTIONS ●

(Always read these precautions prior to use.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to ensure that the product is handled correctly.
The precautions presented in this manual are concerned with this product only. For programmable controller system safety precautions, refer to the user's manual of the CPU module used.
In this manual, the safety precautions are classified into two levels: "WARNING" and "CAUTION".

⚠WARNING	indicates that incorrect handling may cause hazardous conditions, leading to death or severe injury.
⚠CAUTION	indicates that incorrect handling may cause hazardous conditions, leading to minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠CAUTION" may lead to serious consequences. Observe the precautions of both levels because they are important for personal safety. Keep this manual in an easy to access location for future reference, and be sure to provide the manual to the end user.

[Design Precautions]

⚠ CAUTION

- If a data link communication error occurs, the data of the master module will be retained. Using the communication status information, configure an interlock circuit in the sequence program to ensure that the system will operate safely.
- Any of the remote I/O signals marked "Use prohibited" are used by the system. Do not use these signals. In the unlikely event such a signal is used (ON/OFF), the function of the module cannot be guaranteed.
- When installing the RFID interface module and amplifier or antenna cable, do not bundle the cables with or install the cables close to the main circuit, power lines, CC-Link cables, or the like. Be sure to separate the cables and lines by about 100mm or more. Failure to do so will cause noise, resulting in malfunction.
- When storing the product, be sure to observe the defined storage ambient temperature and humidity. Failure to do so will lead to module malfunction and failure.
- Lock the control panel so that only those who are trained and have acquired enough knowledge of electric facilities can open the control panel.
- Install the emergency stop switch outside the control panel so that workers can operate it easily.

Item		Specifications
Noise resistance		DC-type noise voltage 500Vp-p, noise width 1μs, based on a noise simulator with a noise frequency of 25 to 60Hz
Withstand voltage		All DC external terminals – Ground: 500V DC, 1 minute
Insulation resistance		All DC external terminals – Ground: 500V DC, 10MΩ using insulation resistance tester
Protection level		IP2X
Outer dimensions		65(H)×150(W)×45(D)[mm]
Weight		0.3kg
External connection method	Communication area, module power supply area	7-point 2-piece terminal block [transmission circuit, module power supply, FG] M3 x 5.2 screws (tightening torque range: 0.42 to 0.58Nm) No. of inserted compatible crimp terminals: 2 or less
Module installation screws		M4 screw with plain washer finished round (tightening torque range: 0.79 to 1.08N•m) DIN rail installable, installable in 6 directions
Applicable DIN rail		TH35-7.5Fe, TH35-7.5Al (JIS C 2812 compliant)
Applicable crimp terminals		• N1.25-3 (JST Mfg. Co., Ltd.) [compatible wire size : AWG20 to 16] • N2-MS3 (JST Mfg. Co., Ltd.) [compatible wire size : AWG16 to 14]
Applicable Compression tools for wire connectors		• YNT-2216 (JST Mfg. Co., Ltd.), T-212 (Nippon Tanshi Co., Ltd.), NH11 (Nichifu Co., Ltd.) [compatible wire size : AWG20 to 16] • YNT-1614 (JST Mfg. Co., Ltd.), T-221N (Nippon Tanshi Co., Ltd.), NH12 (Nichifu Co., Ltd.) [compatible wire size : AWG16 to 14]

4. MOUNTING AND INSTALLATION

4.1 Usage Precautions

(1) The RFID interface module case is made of plastic. Do not drop the case or expose the case to strong impact.
(2) Before touching the module, be sure to touch grounded metal or the like to release the static electricity from your body.
(3) Tighten the module screws, etc., within the ranges described below. A loose screw results in the risk of a short circuit, module failure, and malfunction.

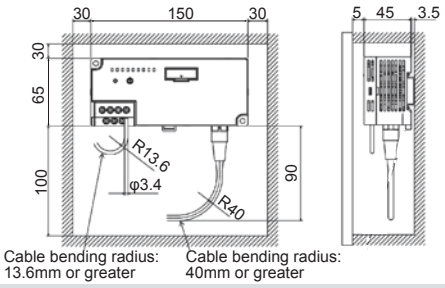
Screw Location	Tightening Torque Range
Module installation screw (M4 screw)	0.79 to 1.08N•m
Terminal block terminal screw (M3 screw)	0.42 to 0.58N•m
Terminal block installation screw (M3.5 screw)	0.68 to 0.98N•m

4.2 Installation Environment

Refer to the user's manual of the CPU module used.

4.3 Cable Installation

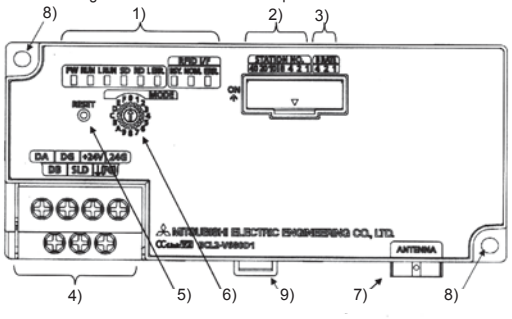
When installing the antenna cable to the RFID interface module, install the cable without applying excessive external force to the connecting section of the module connector.



Cable bending radius: 13.6mm or greater
Cable bending radius: 40mm or greater

5. PART NAMES AND SETTINGS

The following describes the names of the parts of the RFID interface module.



[Installation Precautions]

⚠ CAUTION

- Use the module in an environment that reflects the general specifications stated in the manual. Using the module in an environment that does not comply with the general specifications results in the risk of electric shock, fire, malfunction, and product damage or deterioration.
- Fully secure the module using a DIN rail or installation screws, and fully tighten the screws within the specified torque range. If a screw is too loose, a dropped module, short circuit, or malfunction may result. If a screw is too tight, screw and/or module damage may occur, resulting in a dropped module, short circuit, or malfunction.
- Do not directly touch a powered section or electronic component of the module Doing so results in the risk of module malfunction and failure.

[Wiring Precautions]

⚠ WARNING

- Be sure to shut off all phases of the external power supply used by the system before performing work such as wiring. Failure to do so results in the risk of product damage, and malfunction.

⚠ CAUTION

- Be sure to ground the FG terminal using programmable controller dedicated class D (type 3) grounding or greater. Failure to do so results in the risk of electric shock and malfunction.
- Be sure to tighten any open terminal screws within the specified torque range. Failure to do so causes a short circuit.
- Use the appropriate crimp terminals, and tighten the terminals to the specified torque. If a crimp terminal with an open end is used, the terminal screw will fall off if loose, causing failure.
- Securely mount the antenna cable to the module connector. After mounting, check if there is any lifting in the contact. Poor contact causes erroneous input and output.
- Be sure to secure communication cables and power cables connected to the module by placing them in a duct or clamping them. If not, dangling cables may swing or inadvertently be pulled, resulting in damage to the module or cables, or malfunctions due to poor cable contact.
- When connecting a cable, first verify the connection interface type and then connect the cable properly. Connecting a cable to a wrong interface or incorrect wiring a cable results in the risk of module and external device failure.
- Tighten the terminal screws within the specified torque range. If a terminal screw is too loose, a short circuit or malfunction may result. If a terminal screw is too tight, screw and/or module damage may occur, resulting in a short circuit or malfunction.
- When removing a communication cable or power cable connected to the module, do not pull the cable section. For cables with connectors, hold the connector of the section connected to the module during removal. For terminal block cables, loosen the screws of the terminal block and then remove the cable. Pulling a cable connected to the module results in the risk of module and cable damage, or malfunctions due to poor cable connection.
- Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter may cause fire, failure, or malfunction.
- Do not bunch the control wires and communication cables with the main circuit, power lines, or the like, or install them close to each other. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.

Product Application

(1) This Mitsubishi Electric Engineering Company Limited (hereinafter referred to as "MEE") product shall be used in applications that will not lead to a major accident even in the unlikely event any failure or defect should occur in the product in which this Mitsubishi product is incorporated, and shall be systematically provided with external backup and fail-safe functions that operate in the event of any failure or defect.
(2) This Mitsubishi product has been designed and manufactured as a general purpose product for general industry applications and the like. Thus, the product shall be excluded from use in special equipment, system, and other applications such as those listed below. If used in such applications, Mitsubishi shall not bear any responsibility whatsoever for the quality, performance, and safety of the Mitsubishi product (including but not limited to non-performance of main obligation, defect liability, quality assurance liability, tort liability, and product liability):
- Applications in which the public could be greatly affected such as the applications of the nuclear and other power plants operated by the respective power companies
- Applications in which a special quality assurance system is required, such as the applications of railway companies or government or other public offices
- Use in aircraft, medical applications, railway applications, incineration and fuel devices, passenger vehicles, manned transport devices, equipment for recreation and amusement, and safety devices, in which human life or assets could be greatly affected

Note that such an application of the Mitsubishi product may be permitted as determined by Mitsubishi if the user accepts that the application is to be limited and a special quality is not to be required (a quality that exceeds the general specifications). For details, please consult with Mitsubishi.

Manuals

The manuals related to this product include the following.
Feel free to order the manual if needed.

Detailed manuals

Manual Title	Manual Number	Standard Price
ECL2-V680D1 RFID Interface Module User's Manual (Details)	50CM-D180160	¥3,000

No.	Name	Description		
1)	Display LED	PW		On: Power on Off: Power off
		RUN		On: Operating normally in RUN mode. Flashing: Operating normally in TEST mode. Off: When a watchdog timer error occurs.
		L.RUN		On: Data link is being executed.
		SD		On: Transmitting data.
		RD		On: Receiving data.
		L ERR.		On: Communication data error Incorrect setting switch of Station number or link speed. Flashing (Regular interval) :When the switch of Station number or link speed was changed while the power was ON. Flashing (Irregular interval) :•Un attached the terminator •The cable is disconnected or the transmission path is effected by noise. Off: Operating normally
		RFID I/F	BSY.	On: Operating Off: Standby
			NOM.	On: Communication ended normally Off: Standby or abnormal end
			ERR.	On: Error Off: Normal
2)	Station number setting switch	Used to set the 10's place of the station number using station numbers "10", "20", and "40". Used to set the 1's place of the station number using station numbers "1", "2", "4", and "8". Always set the station number within the range of 1 to 64. (Example) When the station number is set to "32", the switch is set as follows.		

Station No.	10's Place			1's Place			
	40	20	10	8	4	2	1
32	OFF	ON	ON	OFF	OFF	ON	OFF

3) Transmission speed setting switch

Set Value	Setting Switch 4	2	1	Transmission Speed
0	OFF	OFF	OFF	156kbps
1	OFF	OFF	ON	625kbps
2	OFF	ON	OFF	2.5Mbps
3	OFF	ON	ON	5.0Mbps
4	ON	OFF	OFF	10Mbps

Always set the transmission speed in the range above.

4) Transmission /module power supply terminal block

Set Value	Setting Switch
DA, DB, DG, SLD	CC-Link dedicated cable terminal
FG	Class D (type 3) grounding terminal
+24V, 24G	External power supply terminal

5) Reset switch: Resets the module when the CC-Link transmission speed setting was changed, the station number was changed, the mode was switched, or a hardware or WDT error occurred, initializing ECL2-V680D1.

6) Mode switch

Set Value	CC-Link Ver.	No. of Occupied Stations	Extended Cyclic Setting	Data Transfer Size	RUN/TEST Mode
0	Ver. 1 compatible	4 stations		16 words	RUN mode
1, 2, 3	Use prohibited				
4	Ver. 1 compatible	2 stations		8 words	RUN mode
5	Ver. 2 compatible		2x	16 words	
6			4x	32 words	
7			8x	64 words	
8	Test details: Communication test				TEST mode
9	Test details: Distance level measurement				
A	Test details: Noise level measurement				
B, C, D, E, F	Use prohibited				

7) Antenna connector: A connector for antenna connection.
8) Module installation screw holes: Screw holes for installing the module.
9) DIN rail hook: A hook for installing the DIN rail.

EMC AND LOW VOLTAGE DIRECTIVES

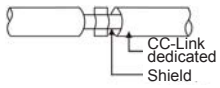
(1) Programmable controller system

When you want to incorporate an EMC Directive and Low Voltage Directive compliant programmable controller into your product to ensure directive compliance, refer to the user's manual of the CPU or head module used.
A programmable controller that is compliant with the EMC Directive and Low Voltage Directive has a CE mark printed on the rating plate of the main unit.
• Authorized representative in Europe
The authorized representative in Europe is shown below.

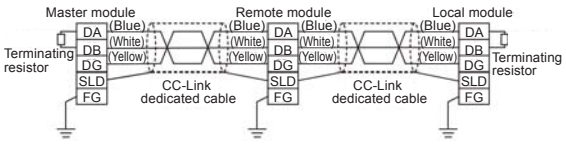
Company name: Mitsubishi Electric Europe B.V.
Address: Gothaer strasse 8, 40880 Ratingen, Germany

(2) About this product

To make this product compliant with the EMC Directive and Low Voltage Directive, the following countermeasures are required.
1) External power supply
• For the external power supply, use a CE mark compatible product and be sure to ground the FG terminal.
• Make the length of the power line connected to the module power supply terminal 10m or less.
2) CC-Link
• Be sure to ground the shield of cables connected to a CC-Link module or each CC-Link station near the outlet from the control panel within 30cm from the module or station.
The CC-Link dedicated cable is a shielded cable. Remove a portion of the outer sheath as shown below, and ground the exposed shield section across as wide an area as possible.

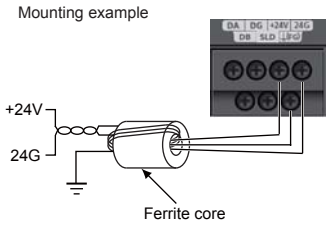


• For CC-Link dedicated cables, always use the specified cable.
• Connect the CC-Link module and each CC-Link station with the FG line inside the control panel using the FG terminal as shown below.

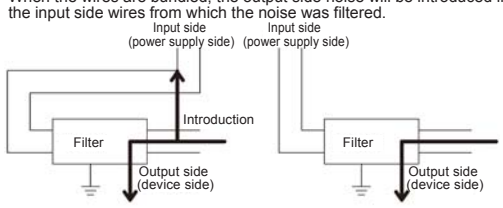


• Use a CE mark compatible product for the power supply connected to the module power supply and external power supply. Be sure to ground the FG terminal.
3) Ferrite core
A ferrite core is effective for reducing noise in the band of 30MHz to 100MHz. In the event an adequate cable shielding effect is not achieved by the shielded cable drawn outside the control panel, ferrite core mounting is recommended. Mount the ferrite core just before the point where the cable is routed outside the cabinet. The ferrite will not be effective if the mounting position is not adequate. Attach the ferrite core to the terminal that connects to the external power supply of the main module, 4cm away from the module.

Mounting example



4) Noise filter (power supply line filter)
The noise filter is a product that effectively reduces conducted noise. Installing a noise filter makes it possible to suppress the noise.
(The noise filter is effective for reducing conducted noise in the band of 10MHz or less.)
Connect the noise filter to the external power supply of the main module and to the external power supply of the extension module.
Use a noise filter that has the same attenuation characteristics as the TDK Corporation product MA1206. This is not required, however, if the product is used in Zone A defined in standard EN61131-2.
The precautions required when installing a noise filter are described below.
• Do not bundle the wires on the input side and output side of the noise filter. When the wires are bundled, the output side noise will be introduced into the input side wires from which the noise was filtered.



Noise will be introduced when the input and output wires are bundled.
Separate the input and output wires.

• Ground the noise filter ground terminal to the control panel using the shortest wire possible (approx. 10cm).

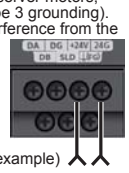
6. WIRING

6.1 Wiring Precautions

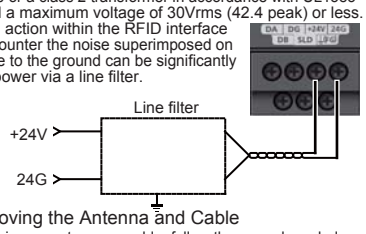
(1) Do not wire the cables near or bundle the cables with main circuit cables, high voltage lines, or load lines other than those of the programmable controller. Doing so causes noise and surge impact, resulting in the risk of malfunction. At the very least, separate the module cables from the above by 100mm or more.
(2) When using a group of equipment, such as inverters, server motors, and the like, be sure to execute class D grounding (type 3 grounding). Failure to do so results in the risk of magnetic field interference from the main body and cable and malfunction.
(3) Do not invert the external power supply polarities. The RFID interface module will not operate.

6.2 Wiring the External Power Supply Terminal

Wire the external power supply terminal as shown on the right.
Connect the 24V DC power supply to the power supply below.



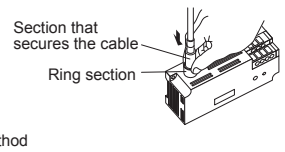
• A circuit (class 2 circuit) having a class 2 power supply module in accordance with UL1310 or a class 2 transformer in accordance with UL1585 as a power supply, and a maximum voltage of 30Vrms (42.4 peak) or less.
• While simply corrective action within the RFID interface module is sufficient to counter the noise superimposed on the power line, the noise to the ground can be significantly reduced by supplying power via a line filter.



6.3 Inserting and Removing the Antenna and Cable

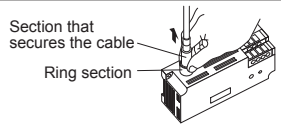
When inserting or removing an antenna or cable, follow the procedures below.
(1) Insertion Method
[1] Hold the section of the connector that secures the cable and insert the connector with the white dot facing upward.
[2] Push the connector straight in until the connector locks.

⚠CAUTION
- Do not insert the connector with the power supply on. Doing so results in the risk of failure.
- The connector will not lock if you push the ring section. Be sure to hold and push the section that secures the cable.

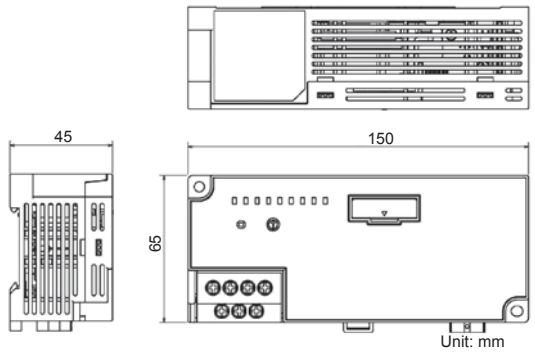


(2) Removal method
[1] Hold onto the ring section and pull straight back.

⚠CAUTION
- The connector cannot be removed by holding and pulling the section that secures the cable. Pulling that section results in the risk of breakage and damage. Do not pull the cable with force.
- Do not remove the connector with the power on. Doing so results in the risk of failure.



7. EXTERNAL DIMENSIONS



Unit: mm

1. OVERVIEW

This user's manual describes the specifications, part names, installation, wiring and connections with other devices, and other information related to the ECL2-V680D1 CC-Link OMRON V680 series compatible RFID interface module (hereinafter "RFID interface module") used as a CC-Link system remote device station.
Once you have opened the product package, verify that the package contains the following.

Item	Quantity
RFID interface module	1
Manual	1
Ferrite core	1
Crimp terminals (Red) (Compatible wire size : AWG20 to 16)	13
Crimp terminals (Blue) (Compatible wire size : AWG16 to 14)	13

2. GENERAL SPECIFICATIONS

Item			Specifications			
Operating ambient temperature	0 to 55°C					
Storage ambient temperature	-20 to 75°C					
Operating ambient humidity	10 to 90% RH, non-condensing					
Storage ambient humidity	10 to 90% RH, non-condensing					
Vibration resistance	JIS B 3502 and IEC 61131-2 compliant		Frequency	Acceleration	Amplitude	Sweep Count
		With intermittent vibration	5 to 8.4Hz	—	3.5mm	10 times each in X, Y, Z directions
			8.4 to 150Hz	9.8m/s	—	
		With continual vibration	5 to 8.4Hz	—	1.75mm	—
			8.4 to 150Hz	4.9m/s	—	
Impact resistance	JIS B 3502 and IEC 61131-2 compliant (147m/s²; 3 times each in X, Y, and Z directions)					
Operating environment	Free of corrosive gasses					
Operating altitude*1	0 to 2000m					
Installation location	Inside control panel *4					
Overvoltage category*2	II or less					
Pollution degree*3	2 or less					

*1: Do not use or store the programmable controller under pressure higher than the atmospheric pressure of the altitude 0m. Doing so may cause malfunction.
*2: This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within the premises. Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300V is 2500V.
*3: This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used. Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.
*4: An environment other than inside the control panel is also applicable if the environment satisfies conditions such as the operating ambient temperature and operating ambient humidity.

3. PERFORMANCE SPECIFICATIONS

The following describes the performance specifications of the RFID interface module.

Item			Specifications		
Model name			ECL2-V680D1		
Connectable antenna manufactured by Omron Corporation			V680-HA63A+V680-HS□□ V680-HA63B+V680-HS□□ V680-H01-V2		
No. of connectable antennas			1 antenna		
CC-Link side	CC-Link station type		Device station		
	CC-Link version		Ver. 1.10 and Ver. 2.0		
	Station number selections		With two occupied stations: Station numbers 1 to 63 With four occupied stations: Station numbers 1 to 61		
	Transmission speed		156kbps/625kbps/2.5Mbps/5Mbps/10Mbps (selectable)		
	No. of occupied stations and data transfer volume	CC-Link version	Number of occupied stations	Extended cyclic setting	Data transfer volume
		Ver.1.10	2 stations		8 words
			4 stations		16 words
		Ver.2.0	2 stations	2X	16 words
				4X	32 words
				8X	64 words
	Connection cable		Ver. 1.10 compatible CC-Link dedicated cable CC-Link dedicated cable (Ver. 1.00 compatible) CC-Link dedicated high performance cable (Ver. 1.00 compatible)		
External power supply			20.4 to 26.4V DC (24V DC -15%, +10%) (ripple rate: within 5%) Current consumption: 0.33A or less (with 24V DC)		

Product Warranty Details

Please confirm the following product warranty details prior to product use.

Gratis Warranty Terms and Gratis Warranty Range

If any fault or defect (hereinafter referred to as "Failure") attributable to MEE should occur within the gratis warranty period, MEE shall repair the product free of charge via the distributor from whom you made your purchase.

■ Gratis Warranty Period
The gratis warranty period of this product shall be one (1) year from the date of purchase or delivery to the designated place. Note that after manufacture and shipment from MEE, the maximum distribution period shall be six (6) months, and the gratis warranty period after manufacturing shall be limited to eighteen (18) months.
In addition, the gratis warranty period for repaired products shall not exceed the gratis warranty period established prior to repair.

■ Gratis Warranty Range
The gratis warranty range shall be limited to normal use based on the usage conditions, methods and environment, etc., defined by the terms and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

Warranty Period after Discontinuation of Production

(1) MEE shall offer product repair services (fee applied) for seven (7) years after production of the product has been discontinued. Discontinuation of production shall be reported via distributors.
(2) Product supply (including spare parts) is not possible after production has been discontinued.

Exclusion of Opportunity Loss and Secondary Loss from Warranty Liability

Regardless of the gratis warranty period, MEE shall not be liable for compensation for damages arising from causes not attributable to MEE, opportunity losses or lost profits incurred by the user due to Failures of MEE products, damages or secondary damages arising from special circumstances, whether foreseen or unforeseen by MEE, compensation for accidents, compensation for damages to products other than MEE products, or compensation for other work carried out by the user.

Changes in Product Specifications

The specifications given in the catalogs, manuals and technical documents are subject to change without notice.

This document is a new publication, effective October 2014.
Specifications are subject to change without notice.
The standard price does not include consumption tax.
Please note that consumption tax will be added at the time of purchase.

Developed October 2014
50CM-D180159-B